

REMARKS

Claims 1-7 and 9-22 are pending. By this Amendment, claim 8 is canceled without prejudice or disclaimer, and claims 1, 3, 12 and 14 are amended. Reconsideration based on the above amendments and the following remarks is respectfully requested.

Examiner Zimmerman and Examiner McCartney are thanked for the many courtesies extended to Applicants' attorney in the course of the personal interview conducted June 10, 2003. The substance of the interview is included herein per MPEP §713.04.

I. The Claims Define Allowable Subject Matter

Claims 1, 2, 8, 10, 11, 12, 13, 19, 21 and 22 are rejected 35 U.S.C. §102(e) as unpatentable over U.S. Patent No. 6,456,289 to O'Brien et al. ("O'Brien"). This rejection is respectfully traversed.

O'Brien does not disclose or suggest "An image generating system..., wherein at least one elemental object has the state change propagation means," recited in independent claims 1 and 12.

Instead, O'Brien teaches the computer modeling of fractures arising in materials due to internal stresses created as the materials deform. (col. 7, lines 36-40). Material (e.g., object 150) is divided into distinct sub-domains or elements 152. "Within each element, the material is described locally by a function with some finite number of parameters. The function is decomposed into a set of orthogonal shape, or basis, functions that are each associated with one of the nodes 154 on the boundary of the element." (col. 10, lines 37-41). O'Brien's animation system resolves internal forces acting on all nodes 154 to determine whether a fracture is generated at a particular node 154 of a material. The fracture algorithm is executed after each step in time. (col. 14, lines 31-42).

O'Brien does not disclose or suggest "An image generating system..., wherein at least one elemental object has the state change propagation means," at least one elemental object having the state change propagation means, as generally recited in independent claims 1 and

12. Instead, O'Brien executes a fracture algorithm after each step in time to determine the internal stresses of all of the nodes 154. The nodes 154 and elements of O'Brien do not have state change propagation means.

Claims 3, 4, 6, 7, 14, 15, 17 and 18 are rejected under 35 U.S.C. §103(a) as unpatentable over O'Brien in view of U.S. Patent No. 6,054,992 to Gibson. This rejection is respectfully traversed.

On page 4, lines 5-7, the Office Action asserts that "O'Brien does not explicitly disclose state hold means which hold a state of an elemental object. Gibson discloses the aforementioned limitation (col. 6, lines 13-28)." However, Gibson discloses a surgical simulation for graphically modeling the cutting of tissue such as muscle, bone, skin, etc. (Col. 6, lines 6-52) instead of the computer modeling of a material fracture using fracture algorithms to determine the internal forces on all nodes of a material as disclosed by O'Brien (Col. 14, lines 30-42). In addition, neither O'Brien nor Gibson discloses a "state change propagation means" including "state monitor means which monitors a state of another elemental object belonging to the same aggregate object as the state-held elemental object, and state change means which changes a state of an elemental object when a state of another elemental object which has a predetermined relationship with the elemental object has changed as recited in claims 3 and 14.

In view of the foregoing, the Office Action is engaging in impermissible hindsight reconstruction using this application as a road map to pick and choose features from the prior art. Accordingly, O'Brien and Gibson, taken individually or in combination, would not have rendered obvious the subject matter of claims 3, 4, 6, 7, 14, 15, 17 and 18.

Claims 5 and 16 are rejected under 35 U.S.C. §103(a) as unpatentable over O'Brien in view of Gibson and further in view of "Animating Exploding Objects" by Mazarak et al. ("Mazarak"). This rejection is respectfully traversed.

Mazarak discloses "the physically-based modeling of a blast wave impact on surrounding objects...to model explosions that result in realistic solid debris,..." (Page 1, Col. 1, lines 1-4). Mazarak discloses using a random value in fracturing algorithms to provide realistic solid debris (Page 4, Col. 1, lines 1-9). However, the computer simulations disclosed in O'Brien and Gibson are for high precision measurements to determine internal stresses of objects (O'Brien) and surgical accuracy (Gibson). One having ordinary skill in the art would not have been motivated to combine computer algorithm using random numbers with the precision computer simulations required by O'Brien and Gibson.

In view of the foregoing, the Office Action is engaging in impermissible hindsight reconstruction using this application as a road map to pick and choose features from the prior art. In addition, Neither O'Brien nor Gibson discloses a "state change propagation means" including "state monitor means which monitors a state of another elemental object belonging to the same aggregate object as the state-held elemental object, and state change means which changes a state of an elemental object when a state of another elemental object which has a predetermined relationship with the elemental object has changed as recited in claims 3 and 14. Accordingly, O'Brien, Gibson and Mazarak, taken individually or in combination, would not have rendered obvious the subject matter of claims 5 and 16.

Claims 9 and 20 are rejected under 35 U.S.C. §103(a) as unpatentable over O'Brien in view of U.S. Patent No. 5,261,041 to Susman. This rejection is respectfully traversed.

O'Brien and Susman do not disclose at least one elemental object having the state change propagation means, as generally recited in independent claims 1 and 12. Since claims 9 and 20 depend from claims 1 and 12 respectively, withdrawal of the rejection is respectfully requested.

II. Conclusion

For at least these reasons, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-22 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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ABSTRACT

An image generating system and information storage medium which can generate an image in which the change of state in an object propagate with less amount of data and reduced load in computation is provided. The image generating system generates an aggregate object (600) which is formed by a plurality of elemental objects. Each of the elemental objects (~~610-1 to 610-9~~) ~~has means (620-1 to 620-9) for holding~~holds its own state in its own state buffer (~~622-1 to 622-9~~), ~~means (640-1 to 640-9) for monitorings~~the other elemental objects belonging to the same aggregate object, and ~~means (650-1 to 650-9) for changing~~changes the state of that elemental object when the states of the other elemental objects having a predetermined relationship relative to the elemental object are changed.